

REMARKS/ARGUMENTS

This application is a continuation-in-part of U.S. patent application Ser. No. 09/396, 164, filed September 14, 1999.

Claims 11, 12, 15, 16, 19 and 20 are canceled. Claims 1, 3, 8 and 17 are amended to correct minor editorial problems.

The Examiner stated that Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narita et al. (5,973,901) in view of Hurest et al. (4,870, 530).

Applicants respectfully request reconsideration of the rejection on the grounds that Claims 1-10, 13-14 and 17-18 are nonobvious in view of Narita et al. and Hurest et al.

Electrostatic discharge (ESD) is a common phenomenon that occurs during handling of semiconductor IC devices. The claimed invention and the patents disclosed by Narita et al. and Hurest et al. relate to devices of preventing inadvertent damage caused by ESD. The claimed invention is nonobvious in view of the Examiner's rejection because the semiconductor device of the claimed invention provides unexpected result and is not taught or suggested by the prior art.

The claimed invention provides a semiconductor device having an unexpected result. The claimed invention provides an ESD protection network having a lower triggering voltage and a lower holding voltage than prior ESD protective devices. The claimed invention also provides an enhanced ESD protection performance apparatus equipped with a common discharge line for protecting VLSI circuits and particularly CMOS devices. The claimed invention

could reduce the SCR triggering voltage from about 30-50 volts of the prior art to a level of about 5-10 volts and stabilizes the voltage of the PNP bipolar junction transistor or the NPN bipolar junction transistor. The claimed invention could provide the semiconductor device to reduce the SCR triggering voltage to protect VLSI circuits because the claimed invention is nonobvious.

Applicants respectfully submit that the claimed invention is not taught or suggested by the prior art. Specifically, Hurst et al. teaches the use of thyristors protecting various pads to an IC package. The resistor R1, disclosed by Hurst et al. is of a low resistance and will trigger on the thyristor T1 when the voltage drop across it is sufficient to render conductive the transistor Q1, as shown in col. 4, line 14 of US Patent No. 4,870, 530. The claimed invention provides a triggering device being placed between said second pole and said first node as shown in Claim 1. One of ordinary skill in the art should understand how important the precision of an ESD protective device is for protecting devices from ESD. With a lower trigger voltage and precisely voltage controlling ability, the ESD protective device can provide more effective ESD protection for devices. For example, the claimed triggering device being placed between the second pole and the first node controls the triggering voltage more precisely than the triggering device disclosed by Hurst. Furthermore, the claimed triggering device could be placed between the second pole and the first node and be placed between the anode and the cathode gate. The anode of the diode (D1) connects to the common bus line (14) as shown in Claim 1 disclosed by Hurst. One of ordinary skill in the art should have the ability to know the claimed protection being more precise and more stable for controlling the triggering voltage after comparing the claimed protective device and the prior protective device disclosed by Hurst. However, if the ESD protective device disclosed by applicant is obvious, why does Hurst et al.

disclose, 'said diode (D1) having its cathode connected to the emitter of said PNP-type transistor (Q1) and its anode connected to the common bus line (14)'? The answer is the claimed ESD protective device that reduces triggering voltage and precisely stabilizes the voltage of the PNP bipolar junction transistor or the NPN bipolar junction transistor being nonobvious. So the claimed invention is not taught or suggested by Hurst.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. The examiner states that the details of the thyristor are not shown by Narita et al. Although Narita discloses an electrostatic discharge protective device comprising a thyristor 11 with an anode connected to a pad 1 and a cathode connected to a common discharge line 10, Narita does not teach or suggest the details of the thyristor. A triggering device D10, i.e. zener diode, is connected between the cathode gate and the anode as shown in FIG. 9. Even if Narita disclosed that a zener diode could be an element of an ESD protective device, another ESD protective device including a zener diode and providing lower triggering voltage and better ability of stabilizing voltages should be nonobvious. Narita et al. does not teach or suggest the limitations of the claimed invention even if Narita disclosed a zener diode is connected between the cathode gate and the anode.

Furthermore, in determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. Hurst et al. teaches the use of thyristors protecting various pads to an IC package and teaches that the anode of the diode has to be connected to the emitter of the PNP-type transistor and the anode of the diode has to be connected to the common bus line. After comparing

the difference between the claimed invention and the patent disclosed by Hurst, the elements of the claimed invention may be obvious, but the claimed protective device as a whole is nonobvious. Even if the protection circuit disclosed by Hurst is combined with the zener diode disclosed by Narita, the protection circuit disclosed by Hurst and Narita still includes a **zener diode** having its **cathode** connected to the **emitter** of said PNP-type transistor and its **anode** connected to **the common bus line**. So the claimed ESD protective device is nonobvious because the claimed ESD protective device is not taught or suggested by anyone of the prior arts or the combination of the prior arts.

The connecting relationship between elements of a device is very important because the device may be broken or cannot work while any connection between two elements being wrong. The claimed invention provides a 'still working' protective device to effectively protect devices from ESD damage and to reduce the SCR triggering voltage from about 30-50 volts to a level of about 5-10 volts. Narita et al. and Hurst et al. did not teach or suggest the protective device of the claimed invention. The claimed protective device provides a lower trigger voltage and a more precisely voltage-controlling ability than the prior protective device provides because the claimed protective device is nonobvious.

CONCLUSION

In light of the above amendments and remarks, Applicants respectfully submit that all pending Claims 1-10, 13, 14, 17 and 18 as currently presented are in condition for allowance. If, for any reason, the Examiner disagrees, please call the undersigned attorney at 202-624-3947 in an effort to resolve any matter still outstanding *before* issuing another action. The undersigned attorney is confident that any issue which might remain can readily be worked out by

telephone.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



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